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## US005719107A

## United States Patent [19]

Outten et al.

[11] Patent Number:

5,719,107

[45] Date of Patent:

Feb. 17, 1998

# [54] CRANKCASE LUBRICANT FOR HEAVY DUTY DIESEL OIL

[75] Inventors: Edward Francis Outten, Beast Brunswick; Andrew James Dakiel Ritchie, Chatham, both of NJ.

[73] Assignce: Exxon Chemical Patents Inc. Linden, NJ.

[21] Appl. No.: 695,353

[22] Filed: Ang. 9, 1996

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#### References Cited

## U.S. PATENT DOCUMENTS

4,282,107	8/1981	Zoleshi et el 252/42,7
4,904,401		Ripple et al 252/32.7 E
4,938,880		Waddoups et al 252/32.7 E
4,938,883	7/1990	Slatna 252/39
4,941,984	7/1990	Chamberlin et al 252/39
4,957,649	9/1990	
4,981,602	1/1991	Rippic et al
5,102,566	4/1992	Fetterman et al 252/32.7 E
5,141,657	8/1992	Petterman et al 252/32.7 E
5,202,036		Ripple et al
5,312,554		Waddoups et al 508/507
5,320,765	6/1994	Fetterman et al 252/32.7 E
5,451,333		Waddoups et al 508/539
5,486,300		Salomon
5,498,355		Perozzi 508/454
5,558,802	9/1996	Dowling 508/518
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## FOREKEN PATENT DOCUMENTS

0 277 729 A1 8/1988 European Pat. Off. ..... C10M 163/00

0 317 354 5/1989 European Pat. Off. . WO 92/18588 10/1992 WIPO .

## OTHER PUBLICATIONS

PCT Search Report date Sep. 5, 1995.

Mack Truck Technical Services Standard Test Procedure No. 5GT 57 "Mack T-7: Diesel Engine Oil Viscosity Evaluation", Aug. 31, 1984 (Mack T-7).

Mack Truck Technical Services Standard Test Procedure No. 5GT 76 "Mack T-8: Diesel Engine Oil Viscosity Evaluation", Oct. 1993 (Mack T-8).

"Corrosion in Lubricant Systems", Dr. Tony Smith, M.Sc., Anti-Corrosion, Nov. 1983, pp. 15-16.

"Corrosion of Copper and Lead Containing Materials by Diesel Lubricants", C. M. Cusano and J. C. Wang, Commins Engine Company, Journal of the Society of Tribologists and Inducation Engineers, Lubrication Engineering, vol. 51, 1, pp. 89-95 Date unavailable.

"The Function of Lube-Oil in Fighting Corrosion in Medium-Speed Engines", P. R. Belcher, Bsc, CEng, Shell International Petroleum Co. Ltd., Lubrication Engineering, Feb. 1993, pp. 145-150.

"Protective Automotive Lubricants", András Zakar, Hungarian Hydrocarbon Institute, Journal of the Society of Tribologists and Lubrication Engineers, vol. 49, 2, pp. 145–150 date unavailable.

Primary Examiner-Jacquetine V. Howard Attorney, Agent, or Firm-E. C. Bakun

[57]

### ABSTRACT

Thus, the instant invention is directed toward an oil for diesel engines comprising an admixture of (A) a major amount of an oil of libricating viscosity, (B) at least 4 mass % dispersant, (C) at least 0.3 mass % of a metal phenate, (D) less than 0.1 mass. % friction modifier, (E) less than 0.3 mass % of ashless sulfurized phenois and, (F) less than 0.12 mass % neutral calcium sulfonate.

14 Claims, No Drawings